

THE EFFECT OF POWER UTILITY RIGHT-OF-WAY
CONSTRUCTION ON CAT-TAIL
(*TYPHA LATIFOLIA* L.) MARSH

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ABSTRACT

Vegetation in an eastern Massachusetts freshwater cat-tail marsh was measured over a five-year period, two years before and three years after construction of a 345 kv transmission line; no change in vegetation occurred because of the construction.

Key Words: Inland wetland, power-line construction, vegetative cover

Darnell (1976) suggested that power utility rights-of-way will have a significant long-term effect on the vegetation of a wetland if the natural cover is disturbed. Thibodeau and Nickerson (in preparation) and Nickerson and Thibodeau (1984) questioned this assumption based on field studies of wooded swamp and bog which were subject to both long-term management and new right-of-way construction. Both areas did show evidence of perturbation, but recovery was rapid. We now report that marsh dominated by the cat-tail *Typha latifolia* L. showed no evidence of disturbance even during the first growing season after power line construction.

During the winter of 1977-1978 a 345 kv transmission line was built across an area of marsh covering approximately 1.5 square miles along the Saugus River in Wakefield, MA. Construction equipment was driven directly across the frozen marsh and no other alterations to the substrate, such as filling, were made. Because the vegetation was uniformly herbaceous, the construction company did not purposefully remove any plants. Any alteration was attributable to incidental effects of the construction equipment itself.

From 1976 to 1980, stem counts of all vegetation were taken during June and July at eight 1 m² stations along a transect under the lines and at eight other 1 m² stations a parallel distance of 50 m from them. The stations were spaced along the transects using a random digit multiplied by 3 m as the distance from one station to the next. 1976 and 1977 growing season measurements were taken before construction; 1978, 1979, and 1980 measurements were taken after construction. These stem counts were converted to measures of diversity and evenness (Shannon and Weaver, 1949) and richness

Table 1. Plant cover comparisons between right-of-way and undisturbed marsh for years immediately before and after construction.

Year	#Species	#Stems	Diversity	Evenness	Richness
1977	9.56±.83	55.30±7.44	1.21±.01	0.63±.01	1.30±.05
1978	10.63±.72	61.02±8.39	1.20±.01	0.61±.01	1.32±.04

Data shown are grand means for each year \pm the deviation between group means under and away from the lines. None of these deviations is significant.

(Margalef, 1957). In addition, analyses were made of the total number of species and of the stem count itself. None of these measures distinguished the two sets of plots in any year-pair using analysis of variance to discriminate between them (SPSS, 1979; $p > .05$ in all cases). The 1977 and 1978 growing seasons, which should mirror the greatest changes, showed no significant differences (Table 1). The vegetative cover ranged from 10% to 80% of each m^2 . *Typha* made up 50% to 95% of the total cover per m^2 . Table 2 lists the major species comprising the plant cover. Names and authorities are those of Fernald (1950).

It appears that in eastern Massachusetts, at least, frozen substrate protects *Typha* rhizomes and other living plant tissues sufficiently from the compaction and mixing which might be expected to occur when construction equipment is used in such a fresh-water cat-tail marsh. Power transmission line construction carried out in this fashion, with no change in the water regime of the wetland, had no demonstrable effect on the plant association of the marsh.

Table 2. Species comprising plant cover¹

<i>Typha latifolia</i> L.
<i>Sagittaria latifolia</i> Willd.
<i>Impatiens capensis</i> Meerb.
<i>Cicuta bulbifera</i> L.
<i>Galium palustre</i> L.
<i>Lemna</i> sp.
<i>Dryopteris thelypteris</i> (L.) Gray
<i>Lythrum salicaria</i> L.
<i>Cephalanthus occidentalis</i> L.
<i>Rosa palustris</i> Marsh.

¹The first three species comprised 80% or more of the cover on any 1 m^2 quadrat; the second four, while often present, never comprised, even together, more than 5% of the cover on any 1 m^2 quadrat; the last three were only sporadically encountered.

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